

ENERGY PLAN

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INTRODUCTION

The function of energy planning in the area planning process for Loudoun County is to effectively prepare for the County's energy future through conservation and efficiency and to provide a framework to guide decision-making. A detailed County Energy Plan may follow the Area Plans. The potential for energy conservation and energy development must be reviewed and priorities for action established. The goals of this eastern Loudoun Energy Plan are to enhance and coordinate the efforts of individuals to conserve energy, to attempt to brighten the energy prospects for future residents of Loudoun County and to keep the costs of energy usage as low as possible for the County and its residents. Although not thoroughly addressed in this area plan, another important energy goal is to assure that the County government itself is an informed and frugal user of energy.

More and more localities have recognized their responsibility to take on an energy planning function since the first oil embargo, the subsequent adoption of national energy legislation, including a call for state energy plans, rising costs to government for energy and the increasing number of crisis situations which require local response. Among the most compelling illustrations of the need for localized short-and long-range planning, are the increasing numbers of families unable to budget for higher energy costs and the rising costs of fuel assistance programs each year.

Thus, the need to plan for wise use of energy and even to recognize the existence of energy resources, becomes more and more apparent. In addition, the inclusion of such a plan as part of the Comprehensive Plan is in compliance with the Resource Management Plan which calls for the conservation of renewable and non-renewable resources.

BACKGROUND

The recommendations for this section have been divided into the following subcategories: land development patterns and practices, transportation, education and other. While much of this discussions may apply to the entire County, a good portion of the recommendations are most applicable and relevant to the eastern portion of the County which has the greatest population growth and hence the greatest energy usage. Many of the land development and transportation recommendations are best suited and in response to suburban growth patterns rather than those of a more rural nature.

Countywide there have already been a variety of responses to the need for energy planning and action. Important programs for fuel allocation, fuel assistance, building rehabilitation and weatherization, fuel crisis management and education have been started or are in full operation. On a regional basis, the County Board of Supervisors has adopted the *"Energy Conservation and Management Plan"* as proposed by the

Metropolitan Washington Council of Governments.¹ This eastern Loudoun plan has not attempted to document or analyze these efforts, but offers recommendations which should complement other programs. The emphasis is on long-range and comprehensive energy planning with a special focus on land use issues. Many recommendations are offered to promote a continuing and growing interest in Loudoun's energy future.

EXISTING CONDITIONS

Although the traditional failure to plan for energy conservation and use has been accompanied by a general failure to collect energy data, some limited information is available. The main sources of home heating fuels in Loudoun County are the fossil fuels such as oil and gas, as well as electricity. The most common heating source has been oil, but since 1970 electricity has been the major heating source for new homes. Reliance upon gas has been limited by a long-standing moratorium on new gas connections which has only recently been lifted.

| TABLE 1 | | |
|---|---------------|---------------|
| PRIMARY HOUSEHOLD ENERGY SOURCE - 1970² | | |
| House Heating Fuel | Number Units | % of County |
| Oil | 6,211 | 59.1% |
| Electricity | 2,100 | 10.0% |
| Gas | 1,636 | 15.6% |
| Wood | 292 | 2.8% |
| LP Gas | 96 | .9% |
| TOTALS | 10,505 | 100.0% |

More recent statistics would probably bear out the trend away from oil which is, of course, in response to the availability as well as the cost of fuel. The use of solar, wind, hydroelectric, wood, geothermal and cogeneration power is presently limited, but may become important for future energy self-reliance and efficiency. (*The use of wood, however, is increasing.*) Price and reliability will again provide a basic incentive for implementation of these technologies, but planning for and promotion of these energy alternatives is important for the County now.

¹ Metropolitan Washington Council of Governments, Washington Metropolitan Energy Conservation and Management Plan - Draft, (Washington, D.C.: MWCOG, March 1979).

² U.S. Bureau of the Census, Census of Housing: 1970 HC (1)-B48 VA, Table 63, p. 48-261.

IMPLEMENTATION

A. LAND DEVELOPMENT PATTERNS AND PRACTICES:

General development patterns as well as site specific orientation and construction practices may have quantifiable impacts on energy efficiency which have traditionally been ignored. The advantages of design which uses natural heating and cooling have been well documented in recent years³ as has the tendency of local land use regulation to thwart the use of energy sensitive development.

A general development pattern which locates housing regardless of the sun and wind angles, promotes a spread out or sprawl pattern which in turn increases dependence on the automobile and necessitates the replacement of natural conditions by concrete and asphalt is, of course, at odds with energy conservation goals. The advantages of the cluster type of development versus "sprawl" development patterns have been discussed in other portions of the Plan, particularly in the Community Design section. This energy plan need not review these implications, but merely emphasize the potential energy benefits of planned, cluster-type development.

On a site specific level there are many strategic placement decisions which may affect energy use. Figure 1, page 280, illustrates some of the energy implications of site design. With basic information such as this, a move should be initiated immediately to work with developers on an informal basis regarding energy concerns in site design. A checklist similar to the one in Figure 2, page 191, may be used for discussion purposes and to provide the basis for fair and equal treatment of all developers in this area. For residential development, densities granted may, in some instances, change with the level of commitment demonstrated by the developer.

A vital counterpart to this move would be one by the County to assure that its own zoning and subdivision regulations allow for designs based on passive energy considerations. Davis, California has provided the model from which many localities are now pursuing energy conscious regulation, and a Loudoun study should take advantage of their pioneering. However, regional climate differences must be carefully considered, and the Davis ordinance could not be simply transferred to eastern Loudoun. Further, the County should proceed with the full realization that rigid criteria that are easily administered may not be useful and may, in fact, work to the detriment of energy conscious site planning. Rigid lot size, setback, yard and street requirements may prove to be obstacles that should give way to more flexible standards. Specific areas of concern which must be addressed before such a study is complete include setback and yard requirements, fence regulations, minimum lot sizes and road regulations.

³

See for example, Gary O. Robinette, Plants, People and Environmental Quality, (Washington, D.C.: GPO, 1972).

Figure 1

Site Considerations for Energy Efficiency

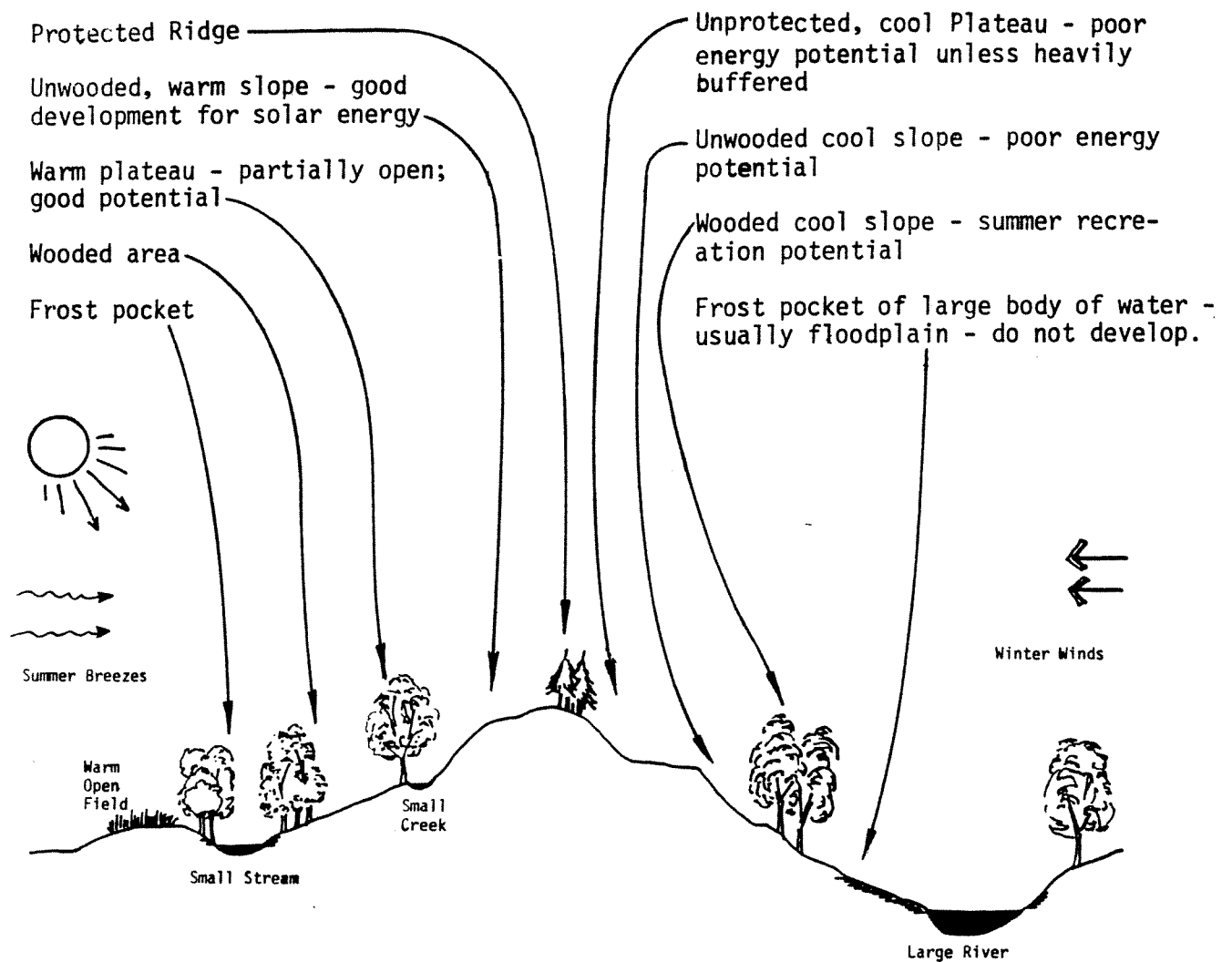


Figure 2

SAMPLE

CHECKLIST FOR ENERGY EFFICIENT DESIGN

| | Used By Developer | Partially Used | Considered but not Used | Not Considered |
|--|-------------------|----------------|-------------------------|----------------|
| <u>SITE DESIGN</u> | | | | |
| Most efficient water, sewer, utility layout | | | | |
| Street design and orientation for energy economy | | | | |
| Cluster development | | | | |
| Mixed-use layout | | | | |
| Pedestrian trails to activity centers | | | | |
| Other | | | | |
| <u>BUILDING PLACEMENT</u> | | | | |
| Housing sited on warm slope | | | | |
| Buildings facing southeast | | | | |
| Non-solar buildings in wooded or otherwise sheltered area | | | | |
| Other | | | | |
| <u>VEGETATION AND BUILDING MATERIAL</u> | | | | |
| Shade trees on east-southeast and west-southwest sides of structures | | | | |
| Windbreaks situated for winter protection, summer cooling | | | | |
| Use of arbors, fences, porches, etc., to enhance passive heating and cooling | | | | |
| Shade trees selected for longevity, density, pollution tolerance, care requirements | | | | |
| Use of materials (e.g., gravel, cobble, bricks and turf blocks) to cut heat load problems associated with asphalt & cement | | | | |
| Other | | | | |

In relation to the last item mentioned, road improvements, the County should continually note the effects of state road requirements on energy efficiency. In developing its own requirements, the County should consider energy losses associated with street widths, replacement of natural drainage swales with artificial channels, and various types of pavement for off-street cover.

In the development of any woodland and tree protection ordinances, (see *Environmental section*) the issue of energy efficiency must be considered. Shading goals for streets, parking lots, commercial developments and county owned buildings should be included. In addition, solar access rights must be considered in the development of vegetation requirements. That is, new regulations must not create a barrier to the expanded future use of solar energy by individual buildings.

B. TRANSPORTATION:

In Energy for Survival, Wilson Clark reports that automobile traffic increased 142 percent from 1950 to 1974 while the amount of energy used by automobiles increased 171 percent. In 1970 alone, autos consumed 65 billion gallons of gasoline or 13 percent of the country's total energy usage for that year.⁴ The need to cut transportation-related use of energy is overwhelmingly apparent. Alternative modes of transportation in eastern Loudoun are necessary. (See *Transportation section of this plan for detailed recommendations.*)

Transportation policies which promote private automobile alternatives are very important, as are overall land use policies which decrease dependency on the private automobile. While the ideal for which to strive would be a drastic cut in the total miles travelled, it should be noted that the types of trips as well as number of trip miles affect energy usage. Short, stop-and-go trips, particularly from cold starts, are not only more polluting, but also less fuel efficient. Thus, traffic flow design and pedestrian accessibility to local services are key considerations.

The Transportation section addresses several energy related issues in some detail. The key transportation strategies are as follows:

1. Promote ridesharing, car pool and van pool facilities as described in the proposed Loudoun County Coordinated Transit System.
2. Construct pedestrian and bicycle trails to connect major activity centers; look into possibilities for expanding pedestrian/bike access as all new roads are constructed.
3. Promote and encourage proffers for the installation of fringe parking and park-and-ride facilities throughout the area.
4. Establish rights-of-way for express lanes on primary highways, where appropriate.

4

Wilson Clark, Energy for Survival: The Alternative to Extinction, (Garden City, New York: Anchor Books, 1974), p. 157.

5. Give preference to car/van pools for all new roads and fringe lots.
6. Combine home-based auto trips to non-work travel via a coordinated County service.
7. Promote citizen awareness of available transit operations in the County.
8. Promote consistent area wide approach to gasoline sales restriction programs and arrange gas availability information programs during crisis situations.

C. EDUCATION:

Because wasteful use of energy is often promoted by misinformation and ignorance, education is an important component of any energy plan. Resources are available from offices such as the Department of Energy, the Virginia Energy Office and the local utilities, and the County should take advantage of existing opportunities for citizen education. County residents should have available to them information on the energy efficiency of home appliances and heating techniques, and widespread use of energy audits currently offered through the State and the power companies should be actively promoted. On another level, the County should begin collecting energy consumption information as soon as possible, so that long term energy planning may be informed and effective.

D. OTHER:

Aside from the above recommendations which may affect the residents of eastern Loudoun specifically, there are other energy strategies which are logical outgrowths of this initial step toward energy planning in eastern Loudoun. The following list includes additional recommendations of the Committee, the most important of which is a call for a County Energy Plan.

1. Develop a county-wide energy plan and seek out grant or subsidy programs available through the state and federal governments for this plan and its implementation.
2. Encourage the use of local energy resources such as corn, wood, recyclable solid waste, and other indigenous fuels to promote energy self-sufficiency.
3. In plans for waste management, give consideration to resource recycling and recovery options.
4. Consider energy efficiency in purchase and/or construction of new County facilities.

5. Include energy consumption predictions in impact assessment process, where possible.
6. Apply for both federal and state energy grants that may promote:
 - a. Energy efficiency in the home
 - b. Alternative modes of transit
 - c. New energy sources for home heating fuels
 - d. Solar access in subdivision design
 - e. Efficiency in design of roadways
 - f. Education of public in energy efficiency
7. Establish a full-time county energy office for crisis intervention, fuel economy in County government and uniformity in county energy (*especially gasoline*) allocations and distributions.